SUMMARY AND ANALYSIS

New Special Access Data for Maine and Vermont

I. Summary

To calculate support for the 2002 year (and now into 2003 as well), the Wireline Competition Bureau ("WCB") conducts a complex pre-processing routine for special access line counts. First, carriers count their current (end of 2001) DS-1 lines in each study area, and multiply by 24 equivalent voice grade circuits. Current DS-3 counts, also obtained from ARMIS, are counted at 672 equivalent voice grade circuits. The sum of these two numbers is then calculated for each study area and reported to the WCB through the ARMIS 43-08 report. The Wireline Competition Bureau then distributes these special access lines throughout each study area and to particular wire centers based on other, older, data that was collected in 1999.

In a reconsideration petition filed in February, 2002, The Maine Public Utilities Commission and the Vermont Public Service Board challenged this process in several ways. We asserted that the WCB should not have used DS-3 data at all, because the model was not designed to process DS-3 data and because including it distorted the resulting cost outputs. We also asserted that the WCB process for allocating special access lines to particular wire centers was seriously flawed because it used an inappropriate mixture of new and old data. We explained the reasons why it is inappropriate to use old data on special access line locations to allocate current lines to specific wire centers. We also observed that these new data appeared to be the principal reason that Maine and Vermont received reduced support in 2002. The work presented here provides useful information on both of these issues.

First, this work shows that the number of DS-3 lines is now significant. The model was never designed to handle DS-3 lines, but the WCB routinely feeds line count data to the model that treats a single DS-3 line as though it were 672 voice grade circuits. The new data show that there are now enough DS-3 lines to substantially distort the cost results.

Second, this work examines the effect of mixing new DS-3 line counts with older 1999 special access location data. We show here that by spreading new lines over the 1999 distribution, the location of special access lines has become highly unreliable.[1] The WCB input data overstates the special access line count in most rural wire centers and understates the number of lines in larger, usually urban, areas. The effect on cost is substantial. The WCB's practice of distributing such lines over rural areas overstates urban costs by approximately $0.75 and understates costs in rural areas by about $0.20. This "homogenization" of costs very likely increases the national average cost and understates costs of large nonrural carriers in states, like Maine and Vermont, that have a high proportion of small, rural wire centers. If so, the inevitable result is insufficient support to those rural states.

II. The Verizon Data

Using our authority derived from state law, the Maine Public Utilities Commission and Vermont Public Service Board requested special access line counts from Verizon. As requested, Verizon did submit detailed data for Maine and Vermont. The data were based on ARMIS 43-08 line counts submitted on April 1, 2002 and reflect the end of 2001. The report details for each wire center in Maine or Vermont the number of DS1 and DS-3 lines served by Verizon.

We then calculated voice-grade-equivalent circuits for each wire center using the same rules that the Commission directs carriers to follow in preparing their ARMIS 43-08 reports.[2] The new data were then compared to existing WCB data used for the 2002 support year calculation. For each wire center we calculated both a correction to the number of lines (voice circuits) and a percentage correction.

III. Findings and Discussion –DS-3 Lines and the Model

Our petition asserted that the Commission's cost model apparently is not prepared

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[1] We do not address here the inconsistent procedures used to collect the 1996 and 2001 data.

[2] Consistent with what we understand to be Wireline Competition Bureau practice, we assigned 24 voice grade circuits to each DS1 line and 672 circuits to each DS-3 line.

to properly process DS-3 input data since the model apparently assumes that a single DS-3 line has the same cost as 25.7 four-wire DS-1 circuits plus 55 two-wire DS-0 circuits. At the time the petition was filed, we recognized that this error could significantly affect the costs calculated by the model and hence the distribution of support.

The Verizon data show that there are now enough DS-3 lines have a substantial effect. In Vermont and Maine, the inclusion of DS-3 lines in the ARMIS count increased the reported total number of special access lines by 58 percent. This means that the model received input data showing significantly too many special access lines in the two states. Because the cost of a DS-3 line in one location in most places is substantially different from the cost of 25.7 DS-1 circuits plus 55 DS-0 circuits, the cost 2002 outputs of the model are not reliable.

IV. Findings and Discussion – The WCB Distribution Method

A. Line Counts

The Verizon data show more generally that the special access line count data used to calculate high cost support in 2002 were highly unreliable. For each wire center with reported data,[3] we calculated the percentage correction needed, using the WCB data as a base. One wire center required a correction of minus 94%. In other words, to correct the WCB data required elimination of 14 of every 15 lines reported by the WCB data. At the other extreme, in one small town a correction of plus 363% was required. In this wire center, for every line in the WCB data, 3.6 lines should be added. The standard deviation of the range of percentage corrections was 55%. The data also show that WCB data have significant errors[4] for 78 percent of the wire centers in the two states, serving 73 percent of all lines. These facts alone establish that the existing WCB data are highly unreliable.

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[3] Verizon did not report special access line counts in approximately 15 wire centers identified in the cost model.

[4] We defined "significant error" as data that require a correction of at least 25% in either direction.

Most errors took the form of overestimation. Overestimates occurred in 74 percent of the wire centers in the sample. This is particularly surprising since overall the WCB data set underestimates the true number of special access lines by 20 percent.

Wire center size had a strong relationship to the direction of the error. For small wire centers with less than 3,000 switched access lines, we found that the WCB data overestimate special access lines in 83 percent of the cases, representing 84 percent of the lines in this size class. For larger wire centers, the bias was reversed. For wire centers with at least 10,000 switched access lines, the WCB data understated the true value in 58 percent of the wire centers representing 68 percent of the lines in this size class.

To verify the hypothesis that the WCB data are biased by size, we reversed the analysis and examined the characteristics of wire centers with large overstatements or understatements. The results confirmed the preceding conclusions. In cases where the WCB data contains large overstatement of true line counts,[5] we found that the typical wire center has only 51 percent of the average number of switched lines.[6] In cases where the WCB data make a large understatement of true line counts,[7] we found that the typical wire center is 75 percent larger than average.[8]

B. Actual Special Access Locations

To determine the underlying reasons for these results, we examined individually those wire centers where the WCB data make a large understatement of true line counts. Interpreting the pattern requires some familiarity with the areas affected. The overall pattern is that wire centers with large understated line counts tend to fall into three

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[5] We defined "large overstatement" as an error requiring a negative correction of 50% or more.

[6] The average wire center requiring a large negative correction has 2,470 switched lines, compared to an average of 4,823 lines in the two-state data universe.

[7] Similar to the preceding analysis, we defined "large understatement" as an error requiring a positive correction of 50% or more.

[8] The average wire center requiring a large positive correction has 8,455 switched lines, compared to an average of 4,823 lines in the two-state data universe.

groups.[9]

1. Large cities.

2. Mid-sized wire centers where there is CLEC collocation or a home office of a CLEC/ISP.

3. Mid-sized wire centers with a known significant business or public enterprise.

The WCB data overestimate special access lines in most small wire centers and underestimate special access lines in almost all large wire centers. As a result, the special access line counts in the WCB data set are unreliable for both urban and rural areas.

C. Costs

The model's unit cost outputs are generally lower where line density is higher. One would expect the above errors to cause the cost model outputs to overstate urban costs and understate rural costs. Also, the distribution mechanism calculates support based on the differences between high cost areas and national averages. National averages are weighted by line counts, and thus are heavily influenced by urban costs.

To test the size of the effect, we performed a three-step analysis with the new Verizon data.

1. We ran the Turbo-Pascal version of the model once using standard WCB data and then a second time using the new Verizon data. We then compared the outputs and calculated a cost correction, per line per month, for each wire center.

2. We placed wire centers into size groups and calculated for each group a single cost correction that would, based on the group's average characteristics, correct the model's cost outputs.

3. We applied the correction factors to the model output cost of each wire center in the country operated by a nonrural carrier, based on its group

[9] We also found a dozen or so small rural wire centers that, for reasons unknown to us, have an unusually high number of DS1 lines or a single DS-3 line.

membership, and calculated high cost support for each state using the corrected cost amounts.

As suggested by the line count discussion, the step 2 results show that a strong correction is needed based on wire center size. The following table shows the average cost corrections developed in step 2.

Wire center size (switched lines)	Average Cost Correction
0 to 999	$ 0.11
1,000 to 2,499	$ 0.23
2,500 to 9,999	$ 0.22
10,000 to 24,999	- $ 0.26
25,000 or more	- $ 0.78

In sum, assigning special access lines to wire centers where they actually exist has the effect of reducing unit costs in large wire centers (primarily urban areas) and increase unit costs in small wire centers (primarily rural areas).

D. Support

The preceding line count errors would have two predictable effects on support. First, increasing urban costs should increase the national average, because a high proportion of total lines are located in low-cost urban areas. Second, costs in high-cost areas are be reduced. Each of these factors reduces support to high-cost ILECs, possibly below levels of sufficiency. In addition, the "portable" support provided to competitive carriers and would be unreliable and would generally tend to provide too little support to competitive carriers serving very high cost wire centers.

We applied the cost correction factors above to the distribution mechanism in step 3 for all wire centers nationally. This would not accurately correct the costs of any individual wire center, but as a statistical approach it is valid to apply as a correction to all wire centers, so long as only aggregated total results are used.

The results were as we expected, and support increased substantially in both Maine and Vermont. Maine support increases from $5.45 to $9.56 million or $0.49 per line per month. Vermont support increases from $9.09 to $11.26 million, of $0.50 per line per month. In both cases, the effect is substantial. Nationally, the total amount of support increased from $232 million to $268 million.

V. Conclusion

The pending petition raises several concerns with special access line counts. Two are: the incompatibility of the model with DS-3 line data as inputs; and the mixing of new DS-3 data with old special access line location data. This work demonstrates that both problems are serious. Including DS-3 line counts as a model input has always been a problem. Now, it is demonstrably a serious problem. Second, the WCB's practice of distributing new DS-3 lines to rural areas based on old line locations has the effect of homogenizing costs. When costs in high-cost areas decrease and costs in low-cost areas increase, the inevitable result is insufficient support to large nonrural carriers, in states like Maine and Vermont, that have a high proportion of small, rural wire centers.